

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

MAIL PROCESSING NETWORK RATIONALIZATION
SERVICE CHANGES, 2011

Docket No. N2012-1

**RESPONSES OF UNITED STATES POSTAL SERVICE WITNESS ROSENBERG
TO QUESTIONS 1 AND 2
OF PRESIDING OFFICER'S INFORMATION REQUEST NO. 6**

The United States Postal Service hereby files the responses of witness Emily Rosenberg to the above-identified questions submitted as part of Presiding Officer's Information Request No. 6, dated March 12, 2012.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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**RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS ROSENBERG
TO PRESIDING OFFICER'S INFORMATION REQUEST NO. 6**

1. Please refer to library reference USPS-N2012-1/46, which contains analysis supporting the cost-per-square-foot estimates used in the LogicNet optimization model.
 - a. Please document all steps used to develop the vetted square footage in Worksheet 2 from "Per Piece Cost Regression" from the square footage data provided in Worksheet 1.
 - b. Please explain why the Postal Service used the cost-per-square-foot estimates developed using the vetted square footage data in Worksheet 2 from "Per Piece Cost Regression" as opposed to cost-per-square-foot estimates developed using the square footage data in Worksheet 1.
 - c. In "Operational Cost per Square Foot for Logicnet.xls" buildings are divided into the following three groups: (1) Buildings with square feet from 0 to 210,000, (2) Buildings with square feet from 210,000 to 450,000, and (3) Buildings with more than 450,000 square feet.
 - i. Please explain fully why the Postal Service selected this particular grouping of facilities.
 - ii. The 0 to 210,000 square feet grouping represents 73 percent of the sample, the 210,000 to 450,000 square feet grouping represents 23 percent of the sample, and the more than 450,000 square feet grouping represents 3 percent of the sample.
 - A. Please provide a regression that uses three groupings with equal sample sizes.
 - B. Please discuss the relative advantages and disadvantages of a regression that uses three groups with equal sample sizes as compared with a regression that uses three groups with unequal sample sizes.

RESPONSE:

Note: All equations used in LogicNet are in cells C48, C49, and C50. Thus, the questions below are all answered in reference to these cells.

- a. The square footage was developed from a series of USPS building surveys.
- b. After comparing the data, the USPS building surveys was deemed more accurate source of information. The sources in worksheet 1 often included more than useable workroom square footage.

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RESPONSE to QUESTION 1 (continued)

- c. (i -ii) The range of square footage is approximately 730,000 SF. I suspect the categories were created to have an even spread of square footage and then adjusted to fit the natural breaks in the data. When dividing

(A) Regression per evenly distribute group

LOW

INTERCEPT 1,281,629

SLOPE 188

MEDIUM

INTERCEPT (1,555,278)

SLOPE 246

HIGH

INTERCEPT 19,658,948

SLOPE 160

- (B) If one evenly distributes the observations per group, then the square footage range for "High" is 588,000 square feet. A 153,000 square foot facility does not have the same attributes as a 740,000 square foot building. As one can see in part (c)(ii)(A), the regression results for medium are counter-intuitive.

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2. Please refer to library reference USPS-N2012-1/46 "Operational Cost per Square Foot for Logicnet.xls".
- a. Please confirm that the Postal Service identified the cost-per-square-foot for three facility sizes according to the process described below. If not confirmed, please explain.

Step 1	<p>Regress Total Cost on vetted square feet and vetted square feet² to identify the coefficients of the following regression equation:</p> $y = \alpha + \beta_1 x + \beta_2 x^2$ <p>Where y is the total cost per facility, and x is the vetted square footage. Then the Postal Service concludes that for all facilities, the average cost per square foot is β_1.</p>
Step 2	<p>Group Facilities according to size and identify the midpoint for each group to be the following:</p> $x_1 = 105,000 \quad x_2 = 330,000 \quad x_3 = 725,000$
Step 3	<p>Identify the slope, m, of the Total Cost Equation to be</p> $m = \frac{dy}{dx} = \beta_1 \times x + 2 \times \beta_2 \times x$
Step 4	<p>Calculate the slope at each of the three midpoint sizes identified in Step 2 to be m_1, m_2, m_3</p>
Step 5	<p>Calculate the predicted total cost for each of x_1, x_2, x_3 according to the relationship identified in Step 1</p> $\overline{y}_i = \alpha + \beta_1 x_i + \beta_2 x_i^2$
Step 6	<p>Identify the equation of a line passing through point x_i by solving for b according to the following formula</p> $\overline{y} = m_i x_i + b_i$ <p>Then b_i and m_i are reported in the equations identified in cells C42, C43, and C44</p>

- b. If confirmed, please explain the discrepancies shown in the table below between the constants, b_i , presented in cells C43 and C44 and the those calculated using the methodology outlined in Step 6.

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QUESTION 2 (continued)

Facility Size	Cells C43 and C44	Step 6 Calculations
210,000-450,000	8,391,559	8,685,184
450,000 - Max	39,320,059	44,940,259

- c. Please explain why the Postal Service did not identify the cost per square foot, M_i , by running the equation identified in Step 1 separately for each of the three facility groupings identified by the Postal Service.
- d. The table below presents the cost-per-square-foot, M_i , following the steps outlined in part (a) and part (c).

Facility Size	Part (a)	Part (c)
Min - 210,000	238.13	250.87
210,000-450,000	198.98	142.33
450,000 - Max	130.25	187.98

Please confirm the estimates for part (c), and discuss the difference in the relationship between facility size and cost-per-square-foot implied by the two methodologies, paying particular attention to the fact that the estimates are monotonically decreasing using the methodology outlined in part (a), but are not monotonically decreasing using the methodology in part (c).

RESPONSE:

- (a) Not confirmed. Steps 2 – 4 are confirmed. Step 1 states “Then the Postal Service concludes that for all facilities, the average cost per square foot is”. The derivative of the function evaluated at the midpoint is the marginal (or average) cost. Step 5 was only used for the *Low* Volume group. To calculate *Medium* and *High* Groups the methodology was adjusted to use the group breakpoints:

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RESPONSE to QUESTION 2 (continued)

- i. Calculate Y at break point
 - ii. Calculate Slope at break point
 - iii. Calculate the difference between Y and Slope*BreakPoint
 - iv. For Medium (High), calculate the Cost using the low (medium) cost function at break point
 - v. Take the difference of step (iv) and break point times slope calculated in Step 4, as defined by interrogatory
- (b) Not applicable.
- (c) The intercept was defined individually by group in order to create a continuous operational cost function. The methodology used has the equation for operation cost for the low group equal the operation cost of the medium group at the break point of 210,000. Similarly the operation cost of the medium group equals the operational cost of the high group at the break point of 450,000.
- (d) See response to part (c).